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THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			SALDANO, LISA M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/645,086	Applicant(s) IRVINE, JOHN E. 	
	Examiner Lisa M. Saldano	Art Unit 3673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/19/2003</u> | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
6) <input type="checkbox"/> Other: _____ |
|--|--|

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the phrase "and the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "and the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

3. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, the applicant recites "a distal end extending outwardly from the wall structure." Then the applicant claims "securing the distal end of each anchor members to an anchor wall." This claim language appears contradictory and does not appear to describe the invention as illustrated. Please clarify.

Claim Objections

4. Claims 1, 12, 14, 17, 18, 19, 22 and 30 are objected to because of the following informalities:

Regarding claim 1, line 16, the applicant's drawing illustrate strengthening flanges extending *from points* along the length of the structural panel. The claim language does not necessarily describe that feature.

Regarding claim 12, line 1, the applicant claims limitations directed to "said retention apertures." However, prior claim language from which this limitation depends does not discuss retention apertures.

Regarding claim 14, line 1, the applicant claims limitations directed to "said strengthening member." However, prior claim language from which this limitation depends does not discuss a strengthening member.

Regarding claim 17, line 1, the applicant claims limitations directed to "the means for attaching step." However, prior claim language from which this limitation depends does not explicitly claim a "means for attaching."

Regarding claim 18, line 1, the applicant claims limitations directed to "the means for attaching step." However, prior claim language from which this limitation depends does not explicitly claim a "means for attaching."

Regarding claim 19, line 11, the applicant's drawing illustrate strengthening flanges extending *from points* along the length of the structural panel. The claim language does not necessarily describe that feature.

Regarding claim 22, line 2, the applicant fails to provide units for the dimension of "0.010."

Regarding claim 30, lines 1 and 2, the applicant claims limitations directed to "said connection means" and "said anchor sheets." However, prior claim language from which these limitations depend does not explicitly claim "connection means" and "said anchor sheets."

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okimoto et al (JP-63312413-A) in view of Nottingham (US 2002/0054791 A1).

Okimoto discloses a sheet pile or structural panel for forming barriers comprising in cross section a central wall section 39, male locking element 41 on a side wall section and a female

locking section 44 on the other side wall section (see Fig.3). The male and female sections are configured to allow a structural panel to slidably receive a duplicate structural panel. Okimoto further discloses strengthening flanges 38 (at joints 40a,40b) integrally formed on an inner surface of a central wall section, wherein the flanges are perpendicular to the central wall section and parallel to each other. The strengthening flanges extend from points along the length of the structural panel.

However, Okimoto fail to disclose that the sheet pile in made from synthetic resin.

Nottingham discloses a sheet pile wall earth retaining system. Nottingham discloses that composite material may be used to construct the sheet pile, i.e., formed plastics, extruded plastics, composite metal and plastic, fiberglass, carbon fibers, aluminum and the like (see page 5, paragraph [0059]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sheet pile of Okimoto with the synthetic resin material, such a plastic, teachings of Nottingham because both inventions are related to sheet pile systems for use in construction sites. Nottingham teaches that sheet piles may be fabricated from a number of materials. The composite materials disclosed by Nottingham suggest plastic materials that withstand severe environmental conditions better than usage of metal materials only.

7. Claims 2-6, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okimoto et al in view of Nottingham, as applied to claim 1 above, in further view of Papetti (5,161,917).

Okimoto and Nottingham disclose the features of sheet piles as discussed above. Specifically, Nottingham discloses that composite material may be used to construct the sheet pile, i.e., formed plastics, extruded plastics, composite metal and plastic, fiberglass, carbon fibers, aluminum and the like (see page 5, paragraph [0059]).

Regarding claim 5, see the above description regarding aluminum.

Regarding claim 6, Okimoto disclose secondary flanges that are substantially perpendicular to the strengthening flanges (see Figs.3&4).

However, Okimoto and Nottingham fail to disclose a strengthening member encased in the plastic and shielded from the outside environment. They also fail to disclose U-shaped cross sections of a strengthening member.

Papetti disclose a method and element for the production of structures for containing areas of the ground comprising plastic coated double twisted metal mesh, which is perforated, with a hexagonal grid (see column 2, lines 5-15). Papetti disclose that such reinforcing materials are used to contain areas of the ground (see column 1, lines 12-25). Papetti further discloses that the plastic coated mesh is resistant to corrosion (see column 1, lines 20-23).

Regarding claim 3, Papetti discloses the plastic coated reinforcing mesh having U-shaped portions that form portions of the ground containing structure (see Figs. 3-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sheet pile of Okimoto to incorporate double twisted metal mesh coated in the plastic, as taught by Papetti and suggested by Nottingham based on disclosure of composite metal and plastic sheet piles, because the metal mesh reinforces the plastic of the sheet pile. Furthermore, the plastic material of the sheet pile provides resistance to corrosion.

Furthermore, regarding claim 4, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a reinforcing member of solid sheet metal because the metal and plastic composite could comprise a reinforcing mesh or reinforcing plate embedded in plastics, as motivated by Nottingham.

Furthermore, regarding claim 14, it would have been obvious to one of ordinary skill in the art to provide a reinforcing member for the sheet pile of Okimoto as modified by Nottingham comprised of U-shaped fiberglass section because Nottingham discloses the fiberglass is commonly used in sheet pile composites and Papetti merely illustrates a manner in which reinforcement may be provided in a ground containing structure.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okimoto et al in view of Nottingham and Papetti, as applied to claim 3 above, in further view of Cataldo (5,865,005).

Okimoto et al, Nottingham and Papetti disclose the inventions as described above. Specifically, Okimoto et al disclose strengthening flanges 38.

However, Okimoto et al, Nottingham and Papetti fail to disclose a plurality of retention apertures.

Cataldo discloses prefabricated retaining walls with central and sidewall portions as well as rearwardly extending legs or strengthening flanges 40 (see Figs. 4A and Fig.6). Cataldo discloses first and second pluralities holes or apertures 50 in the strengthening flanges. Cataldo further discloses that a metal rod can be inserted horizontally along the length of several

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elements of the retaining walls using the apertures 50 to tie them together (see column 5, lines 25-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sheet pile of Okimoto to incorporate apertures and a metal rod, as taught by Cataldo, because Cataldo teaches that the rods tie the sheets to one another. Moreover, the tie-rods supplement the sheet pile connections enhancing the connections of the sheet piles.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okimoto et al in view of Nottingham and Papetti and Cataldo, as applied to claim 7, in further view of Golcheh (6,675,547).

Okimoto et al, Nottingham, Papetti and Cataldo disclose the inventions as described above. Specifically, Okimoto et al disclose strengthening flanges 38 and Cataldo discloses first and second pluralities holes or apertures 50 in the strengthening flanges.

However, Okimoto et al, Nottingham, Papetti and Cataldo fail to disclose an anchor sheet.

Golcheh discloses a method for forming a head wall from an anchor pile and reinforcing member for said anchor pile structure wherein the anchor pile modules 2 comprise a rib or strengthening member 24 with apertures or holes 25. Golcheh discloses a transverse bar 31 engaged through at least one of the holes 25 (see column 7, lines 35-45). Golcheh further discloses backfill reinforcing sheets or elements 5 attached to the anchor bar (see Fig. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sheet pile of Okimoto to incorporate an anchor bar as taught by Golcheh and

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Cataldo, as an anchor sheet as taught by Golcheh only because they provide a means to enhance the stability of the pile within the adjacent backfill or soil.

10. Claims 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okimoto et al in view of Nottingham and Papetti, as applied to claim 3 above, in further view of Tanaka et al (5,364,682).

Okimoto et al, Nottingham and Papetti disclose the inventions as described above. Specifically, Papetti disclose a method and element for the production of structures for containing areas of the ground comprising plastic coated double twisted metal mesh with a hexagonal grid (see column 2, lines 5-15). Papetti disclose that such reinforcing materials are used to contain areas of the ground (see column 1, lines 12-25). Papetti further discloses that the plastic coated mesh is resistant to corrosion (see column 1, lines 20-23).

However, Okimoto et al, Nottingham and Papetti fail to disclose that the metal is expanded metal.

Tanaka et al disclose a composite sliding member with an impregnated metal wire mesh member. Tanaka et al disclose expanded metal covered by one or more material from a list of materials including resin (see abstract).

Regarding claim 13, Tanaka et al disclose that the metal may be one of aluminum alloy or stainless steel alloy.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Okimoto to incorporate a metal mesh coated in the plastic, as taught by Papetti and suggested by Nottingham based on disclosure of composite metal and plastic sheet piles, because

the metal mesh reinforces the plastic of the sheet pile. Furthermore, it would have been obvious to use a resin covered expanded metal, as suggested by Tanaka et al because Tanaka et al teach that such as material has a low coefficient of friction (see column 1, lines 20-25), which would facilitate insertion of the sheet pile into the ground.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okimoto et al in view of Nottingham and Papetti and Tanaka et al, as applied to claim 9 above, in further view of Cataldo (5,865,005).

Okimoto et al, Nottingham ,Papetti and Tanaka et al disclose the inventions as described above. Specifically, Okimoto et al disclose strengthening flanges 38.

However, Okimoto et al, Nottingham ,Papetti and Tanaka fail to disclose a plurality of retention apertures.

Cataldo discloses prefabricated retaining walls with central and sidewall portions as well as rearwardly extending legs or strengthening flanges 40 (see Figs. 4A and Fig.6). Cataldo discloses first and second pluralities holes or apertures 50 in the strengthening flanges. Cataldo further discloses that a metal rod can be inserted horizontally along the length of several elements of the retaining walls using the apertures 50 to tie them together (see column 5, lines 25-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sheet pile of Okimoto to incorporate apertures and a metal rod, as taught by Cataldo, because Cataldo teaches that the rods tie the sheets to one another. Moreover, the tie-rods supplement the sheet pile connections enhancing the connections of the sheet piles.

12. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okimoto et al in view of Nottingham and Papetti and Tanaka et al and Cataldo, as applied to claim 10 above, in further view of Golcheh (6,675,547).

Okimoto et al, Nottingham, Papetti, Tanaka et al and Cataldo disclose the inventions as described above. Specifically, Okimoto et al disclose strengthening flanges 38, Cataldo discloses first and second pluralities holes or apertures 50 in the strengthening flanges AND Papetti disclose a method and element for the production of structures for containing areas of the ground comprising plastic coated double twisted metal mesh with a hexagonal grid.

However, Okimoto et al, Nottingham, Papetti, Tanaka et al and Cataldo fail to disclose an anchor sheet. They also fail to disclose apertures that extend through perforations in a mesh.

Golcheh discloses a method for forming a head wall from an anchor pile and reinforcing member for said anchor pile structure wherein the anchor pile modules 2 comprise a rib or strengthening member 24 with apertures or holes 25. Golcheh discloses a transverse bar 31 engaged through at least one of the holes 25 (see column 7, lines 35-45). Golcheh further discloses backfill reinforcing sheets or elements 5 attached to the anchor bar (see Fig. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sheet pile of Okimoto to incorporate an anchor bar as taught by Golcheh and Cataldo, as an anchor sheet as taught by Golcheh only because they provide a means to enhance the stability of the pile within the adjacent backfill or soil. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide apertures as suggested by Golcheh that extend through perforation of the resin coated metal composite

because doing so maintains more structural integrity of the reinforcing material by not damaging it or placing a hole within it.

13. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler, Jr. et al (6,357,969) in view of Okimoto (JP-63312413-A) and Golcheh (6,675,547).

Wheeler, Jr. et al disclose a method of fabricating a groundwater monitoring system and a monitoring system. Wheeler, Jr. et al disclose in-ground barriers comprising sheet piling driven into the ground; typical sheet piling sections are made of steel plates. Wheeler, Jr. et al further disclose that interlocking sections of sheet piling driven into the ground is a popular, cost effective method for installing barrier walls to prevent the movement of soils and limit groundwater migration. They disclose that sheet piling sections with connectors on the side edges are installed sequentially by interlocking the connectors of adjoining sheet piling sections to form a continuous barrier.

However, Wheeler, Jr. et al fail to disclose means for retaining the wall in a fixed position relative to the soils. They also fail to disclose a strengthening flange.

Okimoto discloses a sheet pile or structural panel for forming barriers comprising in cross section a central wall section 39, male locking element 41 on a side wall section and a female locking section 44 on the other side wall section (see Fig.3). The male and female sections are configured to allow a structural panel to slidably receive a duplicate structural panel. Okimoto further discloses strengthening flanges 38 (at joints 40a,40b) integrally formed on an inner surface of a central wall section, wherein the flanges are perpendicular to the central wall section

and parallel to each other. The strengthening flanges extend from points along the length of the structural panel.

Golcheh discloses a method for forming a head wall from an anchor pile and reinforcing member for said anchor pile structure wherein the anchor pile modules 2 comprise a rib or strengthening member 24 with apertures or holes 25. Golcheh discloses a transverse bar 31 engaged through at least one of the holes 25 (see column 7, lines 35-45). Golcheh further discloses backfill reinforcing sheets or elements 5 attached to the anchor bar (see Fig. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of installing sheet pilings of Wheeler et al to include sheet piles with the strengthening flanges, as taught by Okimoto, because Wheeler discloses an installation method that is useable with most side lockable sheet piling and the strengthening flanges add to the stiffness and strength of a sheet piling. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of installing sheet pilings of Wheeler et al to include sheet piles and means for retaining, as taught by Golcheh, because the means enhance the strength and reliability of the sheet piling system by further anchoring it into the soil.

14. Claims 20, 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler, Jr. et al (6,357,969) in view of Okimoto and Golcheh, as applied to claim 19 above, in further view of Nottingham (US 2002/0054791 A1) and Papetti (5,161,917) and Tanaka et al (5,364,682).

Wheeler, Jr. et al, Okimoto and Golcheh disclose the inventions are described above. Specifically, Okimoto discloses a sheet pile or structural panel for forming barriers comprising in cross section a central wall section 39, male locking element 41 on a side wall section and a female locking section 44 on the other side wall section (see Fig.3). The male and female sections are configured to allow a structural panel to slidably receive a duplicate structural panel. Okimoto further discloses strengthening flanges 38 (at joints 40a,40b) integrally formed on an inner surface of a central wall section, wherein the flanges are perpendicular to the central wall section and parallel to each other. The strengthening flanges extend from points along the length of the structural panel.

Regarding claim 25, Wheeler, Jr. et al disclose in-ground barriers comprising sheet piling driven into the ground; typical sheet piling sections are made of steel plates.

However, Wheeler, Jr. et al, Okimoto and Golcheh fail to disclose a strengthening member of expanded steel within sheet piling of fiberglass.

Nottingham discloses a sheet pile wall earth retaining system. Nottingham discloses that composite material may be used to construct the sheet pile, i.e., formed plastics, extruded plastics, composite metal and plastic, fiberglass, carbon fibers, aluminum and the like (see page 5, paragraph [0059]).

Papetti disclose a method and element for the production of structures for containing areas of the ground comprising plastic coated double twisted metal mesh, which is perforated, with a hexagonal grid (see column 2, lines 5-15). Papetti disclose that such reinforcing materials are used to contain areas of the ground (see column 1, lines 12-25). Papetti further discloses that the plastic coated mesh is resistant to corrosion (see column 1, lines 20-23). Papetti discloses the

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plastic coated reinforcing mesh having U-shaped and L-shaped portions that form portions of the ground containing structure (see Figs. 3-5).

Regarding claim 24, Tanaka et al disclose a composite sliding member with an impregnated metal wire mesh member. Tanaka et al disclose expanded metal covered by one or more material from a list of materials including resin (see abstract). Tanaka et al disclose that the metal may be one of aluminum alloy or stainless steel alloy.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driven sheet pile of Wheeler et al as modified by Okimoto with the synthetic resin material, such a plastic, teachings of Nottingham because both inventions are related to sheet pile systems for use in construction sites. Nottingham teaches that sheet piles may be fabricated from a number of materials. The composite materials disclosed by Nottingham suggest plastic materials that withstand severe environmental conditions better than usage of metal materials only.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driven sheet pile of Wheeler et al as modified by Okimoto to incorporate double twisted metal mesh coated in the plastic, as taught by Papetti and suggested by Nottingham based on disclosure of composite metal and plastic sheet piles, because the metal mesh reinforces the plastic of the sheet pile. Furthermore, the plastic material of the sheet pile provides resistance to corrosion. Furthermore, it would have been obvious to use a resin covered expanded metal, as suggested by Tanaka et al because Tanaka et al teach that such as material has a low coefficient of friction (see column 1, lines 20-25), which would facilitate insertion of the sheet pile into the ground.

Furthermore, regarding claim 26, it would have been obvious to one of ordinary skill in the art to provide a reinforcing member for the sheet pile of Okimoto as modified by Nottingham comprised of U-shaped fiberglass section because Nottingham discloses the fiberglass is commonly used in sheet pile composites and Papetti merely illustrates a manner in which reinforcement may be provided in a ground containing structure.

Regarding claim 22, the optimal range of strengthening member thickness can be developed by routine experimentation.

15. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wheeler, Jr. et al in view of Okimoto and Golcheh and Nottingham and Papetti and Tanaka et al, as applied to claim 20 above, in further view of Cole et al (4,917,543).

Wheeler, Jr. et al and Okimoto and Golcheh and Nottingham and Papetti and Tanaka et al disclose features as described above.

However, they fail to disclose the material as disclosed by the applicant.

Cole et al disclose a wall system employing extruded panel sections wherein the panel section comprises polymeric material such as PVC (polyvinyl chloride).

It would have been obvious to one of ordinary skill in the art to modify the driven sheet pile of Wheeler et al as modified by Okimoto and Nottingham to include PVC material because Nottingham discloses that plastics may be used and Cole et al specifically disclose the use of PVC material for construction of a sheet piling system installable as Wheeler et al disclose.

16. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al (4,917,543) in view of Nottingham (US 2002/0054791).

Cole et al disclose a wall system employing a series of duplicate extruded panel sections wherein the panel section comprise polymeric material such as PVC (polyvinyl chloride, see column 5, lines 15-25). The panels are positioned in edge-to-edge interlocked relationship (see Fig.12).

However, Cole et al fail to disclose that the panels comprise a strengthening sheet.

Nottingham discloses a sheet pile wall earth retaining system. Nottingham discloses that composite material may be used to construct the sheet pile, i.e., formed plastics, extruded plastics, composite metal and plastic, fiberglass, carbon fibers, aluminum and the like (see page 5, paragraph [0059]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the sheet pile of Cole et al made with the synthetic resin material to incorporate the composite teachings of including a plastic and metallic sheet pile, according to the teachings of Nottingham because both inventions are related to sheet pile systems for use in construction sites. Nottingham teaches that sheet piles may be fabricated from a number of materials. The composite materials disclosed by Nottingham suggest plastic materials that withstand severe environmental conditions better than usage of metal materials only. The metal teaching provides a material that is typically stronger than plastics in certain applications, thereby supplementing the material characteristics.

17. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al in view of Nottingham, as applied to claim 27, in further view of Papetti (5,161,917) and Tanaka et al (5,364,682).

Cole and Nottingham disclose the features mentioned above. Specifically, Nottingham discloses a sheet pile wall earth retaining system. Nottingham discloses that composite material may be used to construct the sheet pile, i.e., formed plastics, extruded plastics, composite metal and plastic, fiberglass, carbon fibers, aluminum and the like (see page 5, paragraph [0059]).

However, Cole and Nottingham fail to disclose a perforated metal sheet in a composite sheet pile.

Papetti disclose a method and element for the production of structures for containing areas of the ground comprising plastic coated double twisted metal mesh, which is perforated, with a hexagonal grid (see column 2, lines 5-15). Papetti disclose that such reinforcing materials are used to contain areas of the ground (see column 1, lines 12-25). Papetti further discloses that the plastic coated mesh is resistant to corrosion (see column 1, lines 20-23). Papetti discloses the plastic coated reinforcing mesh having U-shaped and L-shaped portions that form portions of the ground containing structure (see Figs. 3-5).

Regarding claim 29, Tanaka et al disclose a composite sliding member with an impregnated metal wire mesh member. Tanaka et al disclose expanded metal covered by one or more material from a list of materials including resin (see abstract). Tanaka et al disclose that the metal may be one of aluminum alloy or stainless steel alloy.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driven sheet pile of Cole et al with the metal and plastic composite teachings of

Nottingham because both inventions are related to sheet pile systems for use in construction sites. Nottingham teaches that sheet piles may be fabricated from a number of materials. The composite materials disclosed by Nottingham suggest plastic materials that withstand severe environmental conditions better than usage of metal materials only.

It would have been obvious to one of ordinary skill in the art at the time of the invention to twisted metal mesh coated in the plastic, as taught by Papetti and suggested by Nottingham based on disclosure of composite metal and plastic sheet piles, to the sheet pile of Cole et al because the metal mesh reinforces the plastic of the sheet pile. Furthermore, the plastic material of the sheet pile provides resistance to corrosion. Furthermore, it would have been obvious to use a resin covered expanded metal, as suggested by Tanaka et al because Tanaka et al teach that such as material has a low coefficient of friction (see column 1, lines 20-25), which would facilitate insertion of the sheet pile into the ground.

18. Claims 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al in view of Nottingham and Papetti and Tanaka et al, as applied to claims 27 and 28 above, in further view of Golcheh (6,675,547).

Cole et al, Nottingham, Papetti and Tanaka et al disclose the features as described above. Specifically, Cole et al disclose strengthening flanges 65.

However, Cole et al, Nottingham, Papetti and Tanaka et al fail to disclose anchor members.

Golcheh discloses a method for forming a head wall from an anchor pile and reinforcing member for said anchor pile structure wherein the anchor pile modules 2 comprise a rib or

strengthening member 24 with apertures or holes 25. Golcheh discloses a transverse bar 31 engaged through at least one of the holes 25 (see column 7, lines 35-45). Golcheh further discloses backfill reinforcing sheets or elements 5 attached to the anchor bar (see Fig. 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of installing sheet pilings of Cole et al to include means for retaining, as taught by Golcheh, because the means enhance the strength and reliability of the sheet piling system by further anchoring it into the soil.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Oshima (JP-03156032-A), Imakita et al (JP-57155437-A) and Kamata et al (JP-01052913-A) disclose features pertinent to the present application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa M. Saldano whose telephone number is 703-605-1167. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather C. Shackelford can be reached on 703-308-2978. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

lms



HEATHER SHACKELFORD
SUPERVISORY PATENT EXAMINER
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